STATUS OF PROPOSALS FROM MARCH DCS MANUFACTURERS CONFERENCE

The following items represent the current proposals and opinions of the NESDIS Certification Standard review team. All interested parties are encouraged to provide comments, suggestions, or questions they consider appropriate. All items are listed in the order the relevant paragraphs appear in the current Certification Standard, the same as they were presented at the March meeting. The sections of the Certification Standard not mentioned below are intended to remain the same as in the current version.

Interested parties are encouraged to suggest changes to other sections of the Certification Standard in any area that they believe will improve operation of the system.

A.   Timing Accuracy
PROPOSED: +/-0.1 seconds for both 300 and 1200 bps
ISSUES: May be too tight if long time between GPS fixes
                    +/-0.5 seconds suggested as alternate
                    Or "somewhere in between"
ACTIONS: Manufacturers to advise cost trade-off or use of other timing reference
                    Users to advise acceptable cost/accuracy
                    NESDIS will implement the STIWG's decision within the above limits but prefers the timing accuracy be as tight as possible to maximize system utilization
                    (current default value = 0.25 seconds)

B.   Message Format
PROPOSED: Preamble: allow only short preamble at all data rates
                    Bit 4 in flag word changed to undefined new code
                    Rest only shows how other items will be implemented
ISSUES: FSS for interleavers would be eliminated if interleavers are eliminated
                    New FSS could be used to indicate DCPRS compliant with these changes
                    A new field to indicate message length was suggested
ACTIONS: NESDIS solicits opinions and desires from all interested parties
                    NESDIS intends to implement changes as originally proposed and will evaluate any other suggestions

C.   Data Scrambling
PROPOSED: Paragraph rewritten for improved clarity
ISSUES: NONE
ACTIONS: NESDIS WILL IMPLEMENT CHANGE AS PROPOSED

D.   Encoder Flush
PROPOSED: Change from 16 to 32 bits to ensure EOT is always detected
                    Also add turn-off time of 1 millisecond, maximum

ISSUES: NONE
ACTIONS: NESDIS WILL IMPLEMENT CHANGE AS PROPOSED

E.   **Interleaver**
PROPOSED: Delete the option for any user to use an interleaver
ISSUES: Some attendees thought there might be a benefit
ACTIONS: Anyone with data or a theory should provide it to NESDIS for analysis
                 NESDIS will review any information provided
                 If no benefit can be shown, NESDIS will implement as proposed

F.   **Prohibited Characters**
PROPOSED: Eliminate prohibition of ALL prohibited characters except EOT
ISSUES: Intent was to make it easier for users to transmit binary messages
                 The existing prohibition only applied to ASCII and Pseudo Binary formats
                 No approved binary format exists
ACTIONS: Manufacturers and users should provide input to NESDIS if they think the
                 prohibition should be retained
                 If no input received, NESDIS will implement as proposed

G.   **EOT**
PROPOSED: Formally add 32nd bit and correct typo
ISSUES: NONE
ACTIONS: NESDIS WILL IMPLEMENT CHANGE AS PROPOSED

H.   **Maximum Message Length**
PROPOSED: Delete due to conflict with subsection 4.6 Fail-safe
ISSUES: NONE
ACTIONS: NESDIS WILL IMPLEMENT CHANGE AS PROPOSED

I.   **Transmit Frequency Adjustment**
PROPOSED: Delete as this room temperature adjustment is not needed if the proposed
                 change to subsection 4.2.2 "Frequency Stability, Long Term", is made
ISSUES: NONE
ACTIONS: NESDIS WILL IMPLEMENT CHANGE AS PROPOSED

J.   **RF Power Output**
PROPOSED: Change "Typical" to "Minimum"
ISSUES: Current range is too wide – changes reflect levels used in link design
                 May be too high for some power amplifier and antenna combinations
                 Lower levels for all DCPRS would provide better power efficiency
                 Transition would be much easier if a remote control were included:
                 Becomes related to DCPI considerations
                 GOES R could have a higher gain UHF antenna if requested
ACTIONS: Manufacturers need to estimate differential cost of local or remote control

Users need to assess cost/benefit trade-off
STIWG needs to send formal letter to GOES R planners (Steve Kirkner) to
request UHF antenna with at least 5 dB more gain compared to GOES N
(If this extra gain is actually desired)
If no input received, NESDIS will implement as proposed

K. **Operating Frequency Requirements**
PROPOSED: Split all channels into two: 300 bps are 750 Hz and 1200 bps are 1500 Hz
ISSUES: 300 bps channels accepted, but 1200 proposed to be 2250 Hz (= 3 x 750)
Channel spacing is related to sideband filtering and frequency stability
If 2250 Hz channels used for 1200 bps instead of 1500 Hz and 20 channels
are allocated to 1200 bps links, the system capacity will be reduced by 20
300 bps channels and maximum messages per hour drops from about 170k
to about 161k
NESDIS considers either 1500 or 2250 Hz to be acceptable for 1200 bps
ACTIONS: Manufacturers need to provide cost/benefit analysis
Users need to advise what channel spacing is acceptable
If no input received, NESDIS will implement as proposed

L. **Long Term Frequency Stability**
PROPOSED: Change from +/-425 to +/-30 Hz
ISSUES: +/-30 Hz was considered too tight if GPS fix not always available
+/-50 Hz or +/-100 Hz were suggested as alternatives
Frequency stability related to channel spacing and sideband filtering
ACTIONS: Manufacturers need to define what they can provide at "reasonable" cost
Users should advise NESDIS what they can accept
NESDIS will ensure the frequency stability, channel spacing, and
sideband filtering requirements are all compatible
NESDIS will implement whatever is decided, up to +/- 100 Hz maximum

M. **Modulator Stability**
PROPOSED: Combined with next item
ISSUES: NONE
ACTIONS: NONE

N. **Phase Noise**
PROPOSED: Change to one requirement, 3.0 degrees RMS, for all causes
ISSUES: Combines bias and random effects
Needs to have a standard measurement procedure, but not provided
ACTIONS: NESDIS is requesting comments and suggestions
NESDIS will evaluate use of Error Vector Magnitude test set
If no input received, NESDIS will implement as proposed

O. **Narrow Band Transmit Spectrum**

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PROPOSED: Use of SRRC filter with excess bandwidth factor of 1.0 with unneeded sideband energy down 36 and 40 dB in any 100 Hz band, compared to the total power in the necessary bandwidth

ISSUES: This is significantly more than is required by NTIA subsection 5.2.2.2, but the existing requirement does not fully comply with NTIA.
(see figures at end of this document)

ACTIONS: NESDIS will provide an updated change proposal
The following draft is offered for consideration and comment
NESDIS will implement this draft revision unless another way to comply with NTIA subsection 5.2.2.2 can be provided

PROPOSED NEW REVISION TO SUBSECTION 4.5

4.5   DCPRS Transmit Spectrum

When modulated with a random data stream and measured on a spectrum analyzer using any convenient resolution bandwidth of 1 Hz to 100 Hz, the peak response in the unwanted signals, relative to the peak of the mean power within the necessary bandwidth, shall be equal to, or better than:

First and second unwanted sidebands:-	-25 dB
Third to fifth unwanted sidebands:	-35 dB
Sixth and higher unwanted sidebands	$-(43 + 10 \log(P))$ dB, where P is the mean power in watts of the transmitted signal
2nd and 3rd harmonics and spurious signals:	$-(43 + 10 \log(P))$ dB, where P is the mean power in watts of the transmitted signal

If necessary, averaging should be used to provide a smooth, clean, trace.

P.   Mid-Band Transmit Spectrum
PROPOSED: Comply with ITU-R SM.329-10 and SM.1539-1
ISSUES: NTIA section 5.2.2.2 requires $-(43 + 10 \log(P))$ dB
ACTIONS: The above proposed new revision to subsection 4.5 includes requirements previously covered by the mid-band transmit spectrum requirement

Q.   Fail-Safe
PROPOSED: Make 300 and 1200 both equal to 105 seconds
Gives an upper limit of 3,878 bytes for 300 bps and an upper limit of 15,630 bytes for 1200 bps, when non-message time is included in the 105 second time limit
ISSUES: Allows usage up to the limit without any safety margin
ACTIONS: Comments are requested
If no input received, NESDIS will implement as proposed

R.   DCPI Link
PROPOSED: 1200 bps BPSK with Convolutional rate ½ plus RS (255,223) FEC coding plus power change to comply with NTIA PFD requirement plus SRRC filtering to comply with NTIA emission limits

ISSUES: Other data rates and modulation formats are possible
Need to define capabilities needed in the new link
Need to ensure it will be used by enough DCPs to justify its allocation
NESDIS must file a response to NTIA questions in the near future

ACTIONS: NESDIS will file a revised application for the DCPI link using one of the suggested formats that will comply with the NTIA requirements
STIWG needs to define capabilities needed of this link and set a schedule for all activities that will meet NTIA filing requirements
Proposers of formats need to identify receiver characteristics so manufacturers can estimate cost to users if implemented
STIWG and users need to choose a system so NESDIS can re-file with NTIA, if necessary

S.   Test Notes
PROPOSED: No replacement items were offered

ISSUES: The current contents of this section are not applicable to the proposed revisions
NESDIS believes it is in the best interests of all parties to have standard test procedures
What should be included?

ACTIONS: Suggestions are requested

T.   Other